

### **REMARKS**

Claims 1, 3, 4, 8-14, 16, 17, 22, 26, 29, 31, 35, 38-40, 44, 45, 47-48, 50-54, 57-59, 61-65, 67, 68, and 70-93 are pending. Claims 2, 5-7, 15-21, 23-25, 27, 28, 30, 32 – 34, 36-46, 49, 55, 56, 60-70, 77, 85, 86, and 92 have been cancelled without prejudice or disclaimer. Claims 4, 22, 26, 29, 31, 35, 47, 48, 50-54, 57-59, 76, 78-84, and 87-91 are withdrawn from consideration. Claims 94-98 are added. Accordingly, upon entry of the present amendment, claims 1, 3, 4, 8-14, 22, 26, 29, 31, 35, 47-48, 50-54, 57-59, and 71-98 will be pending.

Amendment and cancellation of the claims herein is not to be construed as acquiescence to any objections/rejections set forth in the instant Office Action and were done solely to expedite prosecution of the application. Applicants reserve the right to pursue the subject matter of the claims as originally filed in this or one or more subsequent patent applications.

### ***Support for the Amendment***

Support for the amendments is found in the specification and claims as originally filed. For example, support for new claims 94-98, is at least found in claim 1, and in the specification at Table 4, and at page 31, lines 13-21. No new matter is added.

### ***Objections to the Claims***

The Office Action at pages 2-3 has objected to claims 1, 3, and 71 for informalities. Applicants have amended the claims according to the amendments proposed by the Examiner. No new matter is added. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objections to the claims.

### ***Objections to the Specification***

The Office Action at page 3 has objected to for the specification alleging that there is no brief description of Figure 8 in the Drawings. Applicants have amended the specification to correct the numbering of Figures 5-8 in the brief description of the drawings. As such, the specification provides a brief description of Figure 8. No new

matter is added. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objection to the specification.

### ***Double Patenting***

Claims 1, 3, 4, 71, 92, and 93 are provisionally rejected over claims 50-54 and 61-63 of USSN 11/793,575. Applicants respectfully traverse the rejection. Applicants will address the obviousness-type double patenting rejection upon a finding that the claims (that will be pending upon entry of the amendments presented herein) are in condition for allowance, but for the instant double patenting rejection.

### ***Claim Rejections – 35 U.S.C. § 112, first paragraph***

#### ***Written Description***

Claims 1, 3, 4, 8-13, 71-75, 92, and 93 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly lacking an adequate written description. Claims 1, 3, 4, 8-13, 71-75, 92, and 93 are directed to methods of determining a predisposition or resistance to infection by obtaining a DNA bearing sample from a subject, and assaying the sample to identify the alleles present at microsatellite loci D22S929, D22S277, D22S264, D22S423, D22S418, D22S272 and D22S1169. In support of the rejection, the Examiner asserts that Applicants have failed to describe a sufficient number of species to support the claimed genus. More specifically, the Examiner asserts that the genus of nucleic acid species is defined by function, i.e., resistance to infection. For the reasons detailed below, Applicants respectfully disagree with the rejection and request that it be withdrawn.

An adequate written description of the invention may be shown by any description of sufficient, relevant, identifying characteristics so long as a person skilled in the art would recognize that the invention had possession of the claimed invention (M.P.E.P. 2163.04 II.A.3(a)).

Applicants' specification clearly describes methods of determining a predisposition or resistance to infection by obtaining a DNA bearing sample from a subject, and assaying the sample to identify the alleles present at the microsatellite loci

D22S929, D22S277, D22S264, D22S423, D22S418, D22S272 and D22S1169.

Applicants identified 42 individuals that were resistant to HIV infection despite repeated exposure to the virus (page 25, first full paragraph under the header "EUI and HIV-1-infected individuals"). Applicants found that the genotypes of these individuals identified a number of simple single length polymorphisms associated with the presence of mucosal anti-HIV IgA in HIV-1-uninfected individuals (page 30, lines 23-26). At the D22S423 loci the correlation of uninfected individuals having allele 221 was significantly higher than in HIV-1 infected individuals (page 30, lines 26-28). At loci D22S277 alleles 156 and 159 there was also a statistically significant difference in the frequency with which these alleles were observed in the uninfected group relative to HIV-1 infected individuals (page 31, lines 14-15). These results provide strong evidence that genotypes at this segment of chromosome 22 are associated with enhanced immune responses to HIV-1 in uninfected individuals (page 32, lines 12-16).

In view of this important discovery, Applicants have clearly defined the segment of chromosome 22 that is associated with a predisposition or resistance to infection in terms of microsatellite loci D22S929, D22S277, D22S264, D22S423, D22S418, D22S272 and D22S1169 as recited in claim 1. One skilled in the art provided with Applicant's specification would clearly recognize that Applicant was in possession of the claimed invention as of the filing date. Accordingly, the written description rejection should be withdrawn.

#### *Enablement*

The Office Action at page 10 alleges that the specification "does not reasonably provide enablement for determining resistance to HIV infection using any other allele or using any homologue, splice variant, polymorphism, derivative, complementary nucleic acid or fragment." Applicants respectfully disagree.

As set forth above, Applicants have clearly defined the segment of chromosome 22 that is associated with a predisposition or resistance to infection in terms of microsatellite loci D22S929, D22S277, D22S264, D22S423, D22S418, D22S272 and D22S1169 as recited in claim 1. The sequence of a DNA sample obtained from a

subject could be readily assayed to identify the alleles present at these microsatellite loci, just as described in Applicants' specification at page 30, lines 23-26, where Applicants assayed the genotypes of 42 human subjects to determine the method of determine that the presence of particular alleles was indicative of a resistance or predisposition to infection. Thus, Applicants' specification clearly describes how to make and use the claimed invention. One skilled in the art would clearly be able to practice the claimed invention based on Applicants' disclosures. Nothing more is required. Accordingly, the enablement rejection should be withdrawn.

Applicants have added claims 95-98. Claims 95 and 96 are directed to methods of determining a predisposition to HIV infection by obtaining a DNA bearing sample from a subject, and assaying the sample to identify the alleles present at microsatellite loci D22S277, D22S423, and/or D22S272, wherein the presence of an allele 134 bp in length at microsatellite loci D22S277, the absence of an allele 221 bp in length at microsatellite loci D22S423, and the absence of an allele 156 or 158 bp in length at microsatellite loci D22S272 is indicative of a predisposition to infection. Claims 97 and 98 are directed to methods of determining a resistance to HIV infection by obtaining a DNA bearing sample from a subject, and assaying the sample to identify the alleles present at microsatellite loci D22S277, D22S423, and/or D22S272, wherein the absence of an allele 134 bp in length at microsatellite loci D22S277, the presence of an allele 221 bp in length at microsatellite loci D22S423, and the presence of an allele 156 or 158 bp in length at microsatellite loci D22S272 is indicative of a resistance to infection. For the reasons below, Applicants respectfully request these claims be considered for allowance.

Regarding the written description of claims 95-98, the Examiner at page 7 of the Office Action dated July 6, 2010 states "There is reduction to practice of four alleles: (1) an allele with the size of 134 base pairs (bp) at D22S272 and (2) allele 221 bp at D22S423, which frequencies are significantly different in the HIV-exposed but uninfected group when compared to the healthy control group and the HIV-infected group (see Table 4 on page 38), and (3) allele size 156 bp and (4) allele 158 bp at the D22S277 locus, which frequency showed significant difference in the HIV-exposed but

un-infected froup when compared to the combined healthy control and HIV-infected group (spec. p. 31, lines 13-21). Moreover, as acknowledged by the Examiner on page 10 of the Office Action, the specification is "enabling for determining resistance to HIV infection comprising assaying or sequencing a DNA sample to identify the presence of allele 134 at D22S272, allele 221 at D22S423 and alleles 156 and 158 at D22S277...." Thus, Applicants respectfully submit that Applicants were in possession of the invention recited in claims 95-98 presented herein, and that claims 95-98 are commensurate in scope with the level of enablement provided by the specification.

Therefore, Applicants respectfully submit that claims 95-98 traverse the present rejections, thus, paving the way for their allowance.

**CONCLUSION**

In view of the foregoing amendments and arguments, Applicants respectfully request reconsideration and withdrawal of all pending objections/rejections and allowance of the application with claims 1, 3, 8-14, 71-75, and 93-98 presented herein. If a telephone call with Applicants' representative would be helpful in expediting prosecution of the application, Applicants invite the Examiner to contact the undersigned at the telephone number shown below.

Dated: January 6, 2010

Respectfully submitted,

Electronic signature: /Elbert Chiang, Ph.D. /  
Elbert Chiang, Ph.D.  
Registration No.: 60,325  
EDWARDS ANGELL PALMER & DODGE LLP  
P.O. Box 55874  
Boston, Massachusetts 02205  
(617) 517-5502  
Attorneys/Agents For Applicants